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EDITORIAL

"THE OLD-TIMER" AND THE CHEMIST

Considerable interest has been created among platers as a result of the recent discussions involving the "old-time plater" and the man of science, the chemist.

Plating is a combination of **Art** and **Science,** and the successful plater is the man who has learned to combine Art and Science and apply both to his daily plating practice. "The Old-Timer," yet successful plater, is an Artist; he may lack scientific training, and be unable to explain the whys and wherefores of the different chemicals that enter into his daily plating practice—may even have the wrong explanation—yet he produces results, and results are what count. His cleaning and plating formulas may be the results of "cut-and-try" methods and by accident stumbling onto the right thing to do, and in doing that faithfully acquire skill in determining and applying successful plating practice. Lacking scientific knowledge he, as an artist, produces satisfactory results, along with some sleepless nights, worry and some defective work. Much of this worry and uncertainty might have been avoided if the plater had more scientific knowledge, or had he sought advice from the chemist.

Our observations would indicate that the greatest degree of success is achieved by co-operation of the plater and chemist, each allowing for the other's faults and lack of knowledge.

The plater who acquires scientific knowledge by study and seeks advise from the chemist, electrical engineer and metalurgist will make more rapid progress than the plater who feels he has no such need.

THE PRODUCTION OF IMITATION ANTIQUE SILVER FINISHES BY THE AID OF ALKALINE ZINC DEPOSITS AND ANTIMONY OXIDE

By Charles H. Proctor

Antique finishes are still the predominating factor in electro-plating and art metal finishes and from present indications will continue for some time to come. The reproduction of the various periods from the Gothic, the Italian Renaissance and the Flemish to the Colonial, in metal, in furniture and articles of personal adornment, and the unlimited demand for such periods in antique finishes, assures a continuation of such finishes. The Colonial is a combination of English and French Renaissance.

Looking backwards nearly four decades, one remembers that the present antique finishes were then in vogue. Polychrome was then considered a splendid composite finish when properly applied by men of artistic temperament. Even as the poet in his songs sees the wonders of nature in all its beauty, so the polychrome artist that understands the wonderful color schemes of nature, produces some splendid examples of this most popular finish today.

The advent of the spraying method of appliction of colored enamels, pigments and bronzes within the past two decades gave an impetus to the production of antique finishing upon metal lighting fixtures of every description, as well as application to art goods produced by the metallizing or galvano process, of depositing copper upon non-metallic surfaces, such as compo plaster wood, etc. Some splendid examples of sprayed finishes may be seen in our art shops and color blending has been carried out by the method to a point where it can be truly said that art and the artist have combined in its production. Unfortunately, however, art is being murdered to the last degree in the production of polychrome and the sprayed finishes, by some men that have no more conception of color schemes in art than a "jackass has for hard coal." In the production of antique metal articles, as applied to furniture of the various periods, now so much in vogue, polychrome or sprayed enamel or pigment finishes are very sparingly used for the very reason that there was no spraying apparatus, no lacquering of

metal goods in the periods in which the originals of the present day period furniture was produced. Metal goods were fabricated by hand tools, the indentations made by such tools and the oxidation of the metal surfaces, due to heating or annealing, are the real Hall Marks of such periods that the electro-plater of today is called upon to imitate as close to the original finish as possible. The old English burnt brass finish that resulted from the fabrication of the metal articles in the Elizabethan and Colonial periods is now being produced upon a very extensive scale at the present time, as the metal decoration for reproduction of the splendid periods of long ago. Metal article decorations, of antique silver, copper and brass, give splendid contrasting effects upon the dark-toned wood used in period furniture production, and the demand is constantly on the increase. However, it seems as though I am getting away from my subject, as dreamers usually do, but even in our dreams coming events sometimes "cast their shadows before them." Some few weeks ago a member of the American Electro-Platers' Society approached me and stated that he had been trying to imitate antique silver finishes for special purposes in antique furniture trimmings, but had not been successful in his experiments, primarily due to the fact that he had been unable to develop an immersion black that would give the desired antique effect in relief upon the zinc-plated surface which could be readily produced in a normal zinc cyanide solution. I promised to give what assistance I could and later, after I had dreamed for a while, I set to work to produce some samples for him and finally sent them to him, in a not far distant city. The samples were very interesting and apparently were what was desired, and full data covering the manipulations were requested. I have finished an additional set of samples for your persual. If the gentleman is present that originally proposed the question I am going to give him the answer. "All for one and one for all." This should be a new motto for the votaries of the American Electro-Platers' Society, among whom no dissension should ever exist. "Except that Nobler Contention, or rather, Emulation, of who can best work and best agree." In the production of a similar finish upon a commercial scale any of the basic metals can be used—steel, copper,

bronze or brass—or any metal desirable upon which zinc can be readily deposited.

It is not necessary for me to go into the methods of polishing or cleansing or the solutions used in cleansing. Every plater is familiar with such operations. The zinc cyanide solution may consist of any good formula containing small proportions of a mercuric compound, such as the recently developed "cyanobrite."

An example of such a zinc cyanide solution is as follows:

Water	1 gal.
Sodium Cyanide, 96-98%	4 ozs.
Zinc Cyanide	4 ozs.
Caustic Potash or Soda	4 ozs.
Cyanobrite	1-16 oz.

The proportions may be increased for a more rapid deposit up to double the amounts given. The temperature should be maintained at 120° Fah. at 4 volts minimum. The amperage from 25 to 40 per square foot of surface area. The anodes should be pure zinc to enable the zinc deposit to be as white as possible. A most satisfactory anode, however, is a recently developed zinc anode commercially termed "Duozinc." This anode contains the metal collodial factor that has proven unusually successful in electro-zinc plating from cyanide soltuions. The thickness of zinc may be as desired. However, a ten-minute deposit under solution and current conditions outlined will give ample thickness for the final finishing. After zinc plating, as outlined upon removal from the zinc solution, the articles should be thoroughly washed in clean, cold water and immediately immersed in the oxidizing solution. The oxidizing solution should be prepared as follows:

Water ..... 1 gallon. Temp. 140°-160° Fah
Caustic Soda ... 1 oz. Antimony Oxide. 1/8 oz.

These proportions may be slightly increased. The formation of the black oxide is so rapid that it is hardly necessary to increase the proportions but renew the solution as found necessary by deterioration.

After the black oxide is produced, remove at once from the solution and then thoroughly wash in clean, cold and boiling waters. The articles may now be relieved by any

of the usual methods in vogue for the relieving of antique silver or silver-plated articles.

Finally, the articles should be lacquered to give an added protection to the antique surface. A lacquer that is specially prepared for polished zinc surfaces is advisable. The results will be as you can best judge by the samples submitted for your inspection. I have also found in the course of my recent experiments that an excellent black color may be produced upon zinc by the precipitation of a lead sulphide upon its surface. Platers who have to produce rust-proof black enameled or japanned surfaces upon steel and use zinc deposits as the rust-proofing factor can utilize the following solution to an advantage. It will, no doubt, enable them to produce more adherent enameled or japanned surfaces upon electro deposited zinc. Furthermore, the black coating so produced will save one coat of enamel in many instances. The solution should be prepared as follows:

Water	1 gal.
Sodium Hyposulphite	2 ozs.
Lead Acetate	1 oz.
Acetic Acid	1-32 oz.

Temperature 140° to 160° Fah.

In closing, I would state that in the use of the antimony oxide solution, it is absolutely necessary that the zinc surface be colored at once. If the zinc surface is allowed to dry before coloring, a black deposit will not result, due to a slight oxidation that develops upon the zinc surface when exposed to the atmosphere. Furthermore, the antimony oxide solution can be used for many purposes when black antique finishes are wanted. The mere deposition of a film of zinc upon any metal will become immediately blackened when immersed in the solution. Cadmium is a difficult metal to oxidize by simple immersion solutions, but if, after cadmium plating, the merest film of zinc is deposited upon its surface, a black can be obtained in a moment in the antimony oxide solution that will be as effective as though all zinc had been deposited instead of cadmium.

Notice to Secretaries—1923-1924 Membership Cards are now ready for distribution. F. J. HANLON, Secretary.

THE METHODS AND PROCEDURE OF ELECTRO-GILDING OF HIGH-GRADE RELIGIOUS GOODS AND CHURCH WARES

By F. D. MacSTACKER

(All rights reserved)

To those of you that are acquainted with the fore-mentioned type of articles it is reasonable to expect that goods of this kind would be handled in a somewhat different and more particular manner than is the usual with the general class of gold-plated goods that are commonly seen and used. Those of you that are not so acquainted will readily understand that these wares must and should, because of the handling they are subject to in daily use, be covered with a fair quantity of the precious metal to assure wearing qualities and service to the purchaser. The material, or base metal of which a considerable quantity of these articles are made, is sterling silver—so chosen, probably, because of its superiority over brass, copper and the like in not discoloring and corroding when the gold plate wears off, and because of the common feeling that articles used in religious ceremony should be as good in quality as can be afforded. Some of the less expensive goods have certain parts of them made of brass copper and nickel silver, but practically all of the cups and plates in which the sacremental wines are poured or contained are of sterling. These articles as they come from the various departments of manufacture in the shop where I am situated are sent to the polishing and buffing room, where the surface of the metal is prepared by the usual methods of emery finishing. Sand-bobbing and grease-buffing, as the need be, after which they go to a wash room to have all heavy grease and buffing composition removed. When dryed they are sent to the plating department, but some of the goods are first weighed for the purpose of determining loss in silver through buffing, and to be able to find the amount of gold deposited on them. After being delivered to the plater they are wired or racked, as the need be, and immersed in a cleaning solution for a short period, then rinsed well and scratch-brushed with very fine wired brass or German silver brushes, rewired and passed through the cleaning solution again, rinsed and placed in the gold bath and allowed to remain until a quan-

tity of gold is deposited in accordance with the quality of the article. The method of determining when the amount of gold that is required is deposited, while not quite accurate, according to some standards, is fairly so and reasonably dependable, in view of the resulting weights after plating. The article to be plated is known by its size and type, and note taken of how much gold has been deposited on previous occasions on one of its like in a given time in the electrolyte containing an approximate amount of metal, degree of heat, anode surface and current efficiency maintained. For example, the article on exhibit on the table is what is known as a chalice, used by the priests of the Catholic churches at the Communion service. Two of these chalices plated in an electrolyte containing approximately 7 pwts. of 24-karat fine gold and 3 ounces of sodium cyanide per gal., with a temperature of 140° Fahrenheit and an anode surface of 4 square inches, with ¾ of a volt and 4 to 5 amperes of current efficiency will have between 7 and 8 pwts. of gold deposited in 25 minutes plating in the bath, and seldom will it vary more than 1 pwt. in amount. The amount of gold in the bath is kept account of by deducting what is deposited on the articles plated after taking also into account the amounts of metal taken into the bath from the reduction of the anodes, and gold is added in a fulminate periodically to keep the bath uniform in metal content. The work is then removed from the bath and scratch-brushed over, rewired and passed through the cleaning solution, again rinsed and flashed in the gold bath for ten seconds to color it a good yellow, rinsed and dryed and sent to the burnishing department, where it is burnished, partly by hand and partly by lathe, with steel and stone tools, after which it is assembled and packed ready for the purchaser.

THE PRODUCTION OF VERDE ANTIQUE UPON BRASS, BRONZE, COPPER AND PLATED GOODS

By Phillip Morningstar

(All rights reserved)

The purpose of this paper is to outline the method of procedure as the writer has experienced in producing a verde antique green finish, productively on plated articles.

Unless articles are of the solid metals, plating must be resorted to, and for this purpose articles are plated in the cyanide copper solution. Where heavy deposits are required the acid copper solution is usually used. The Verde antique finish produced upon cyanide copper and acid copper deposits are of different shades.

(2) In producing these various shades of green it is well to remember that scratch-brushing work after plating will give a lighter shade of green. Another point well to remember is where platers are using sodium bisulphite in cyanide solutions, makes it very hard to produce a green verde. hiTs also happens where sodium hyposulphate is used; in this case the verde flakes off while in stock. Cyanide solutions that plate with a dark smut always give better results.

(3) For this work two or three reubberset bristle brushes are required. These must be dipped into green solution and let lay to dry. Repeat this several times. As a matter of fact, it is very hard to produce a verde finish with a new brush. For that reason it is best to break them in first by letting the verde solution dry into the brushes.

The next procedure is to prepare a box for sawdust—any medium grade of soft wood sawdust will act for this purpose. Solution used for moistening sawdust is as follows: Water, 1 gal.; salamoniac, 4 ozs.; acetic acid, 4 to 6 fluid ozs. This solution is added to sawdust until damp. Best results are obtained when sawdust has aged. It will readily be noticed if sawdust needs replenishing. This is determined if work appears to be too yellow; add acetic acid to sawdust. If too green, add salamoniac. In hot weather it is good practice to keep a wet cloth over the sawdust to prevent it from getting too dry.

The next procedure is to prepare the verde green solution as follows: Water, 1 gal.; copper sulphate, 8 ozs.; copper acetate, ¼ ozs.; zinc chloride, ¼ oz.; sodium chloride, 4 ozs.; glycerine, 1 fluid oz.; acetic acid, 2 fluid ozs. In handling work for Verde, dip article in solution and let drain, then stepple with brush until partly dry and set in damp box until quantity of work is finished. Then pack in sawdust for 30 minutes to one hour. After work has been removed from sawdust let stand to dry about five minutes.

The next procedure is to prepare one part beeswax, one part parafine wax and one part cannabra wax. These are melted together and left to cool until hard. This is applied on a tampica wheel revolving at about 1,800 revolutions; the work is well brushed until surface is covered. The reason these three different grades of wax are used is because beeswax and parafine are too soft and cannabra is too hard to be used alone, so the three are melted together, which makes a medium wax for this purpose.

The procedure of manipulation in producing various shades of verde antique green is as follows: (1) In producing a gray green, acid copper plate and brass plate first, then plate in arsenic black nickel, after which dip in verde solution and stepple until partly dry. Lay aside until dry, then stepple second coat for final finish. Set in damp box until quantity is finished, after which pack in sawdust for thirty minutes to one hour. Expose to dry for waxing. (2) In producing black green, acid copper plate first, then oxidize, dip in verde solution and stepple one coat and set it in damp box until quantity is finished, then pack in sawdust for thirty minutes to one hour. The work is exposed for a few minutes to dry for waxing. (3) In producing a brown green, acid copper plate first, then bronze plate, dip in verde solution and stepple one coat until partly dry and set in damp box until quantity is finished, then pack in sawdust, as previously mentioned.

(4) In producing a salmon color high light and green background, acid copper plate and dip in Verde solution, wipe off high lights with dry cloth and stepple parts to show green, wipe again before laying aside, then set in damp box as previously mentioned, the same procedure.

(5) In producing a light green, acid copper first for 20 minutes, then brass plate for 20 minutes, dip in Verde solution and stepple on a coat until partly dry, set in damp box as previously mentioned, with same procedure. (6) In producing a mild green, acid copper for 30 minutes, dip in Verde solution and stepple two coats, set in damp box, as previously mentioned. (7) In producing a reddish brown Verde, cyanide copper for 30 minutes, dip in Verde solution and stepple one coat, set in damp box, as previously mentioned. (8) In producing a very dark brown with

Verde, cyanide copper plate for 30 minutes in a solution that plates with a drk smut, then dip in Verde solution and stepple one coat. Carry out previously mentioned procedure.

In closing this paper the writer hopes it will be a benefit to all those interested.

Written for the New York Branch of the American Electro-Platers' Society.

HYDROFLUORIC ACID IN NICKEL SOLUTION

(Paper read at the banquet of the New York Branch, February 17, by a member of the Philadelphia Branch)

Not a new subject but a further boost for the using of the acid in a single nickel solution of 800 gallons, built up originally from a double salt solution three and one-half years ago. But changed to single by the addition of 400 lbs. of single dry salt Ni H_2 SO_4 and 100 lbs. of Epson salts, no other addition except the acid and water from time to time, or about 3 gal. daily. The solution after adding salts stood about 15 degrees and now, after using three and one-half years, stands close to 14 degrees. During this time approximately 650 lbs. of 9597 nickel anodes were put in use and consider that about that amount was consumed, not having had the weight of anodes in the tank at the time of composing, nor at this time, either, but this amount was placed in use, replacing as needed, and always having a full tank. The solution must be kept supplied at all times with the acid, and great care exercised that not over done, otherwise the nickel will harden and brittle, and if carried to excess will cause peeling at edges, although this can be regulated over a wide range by reducing the current and increasing the time. But if kept to the right proportions a wonderful quick and durable plating will be produced with a long range of current from low to high, either on voltage or amperes, as desired time alone need to be considered, it being possible to plate fine instrument work along with heavy work, such as a radiator shell, bumpers, etc.; however, this is not advisable if time is to be considered, as, of course, the instrument will not require the amount of time to get the same plating as the radiator shell, but where so required to place all in one batch, all can be well plated with-

out failures or trouble. The plate, if the acid proportion be carried out rightly, should be of a fine, smooth, even texture, feel glossy overlook semi-bright on a piece of brass cut down with tripoli or on steel polished on No. 160 emery and tampico brushed with emery paste. Should have fine adhering qualities on brass or iron, can be rolled or bent without breaking at the thickness of a fair quality writing paper, and will plate to extra heavy thickness of wrapping paper. However, articles that get extreme wear only get such a heavy plate. The adhering qualities are wonderful, as some of our trade require extra quality on their radiator shells, bringing to us entirely new shells, which we buff highly, then cleanse with caustic and muratic acid strong and run shell in nickel tank for an hour, which gives a fairly heavy plate, and under the color buff gives a perfect finish.

This solution is used on general jobbing and carries without much variation about $20,000 per year in work value under jobbing shop prices, work of the finest testing and scale work to heavy safe and auto parts, disc wheels, etc.

The scum which gathers on the ordinary nickel tank is the guage to go by in using the acid. Use just enough to take the scum away after first removing any grease that may be present. It is better to make a couple additions than to try and make the first addition with one application. And between putting in always best to allow three days, as there is no draw back to not getting enough in, except that if allowed to be continually short, the solution would be depleted of metal. Add just enough to clear up the scum but still have a trifle or shadow of it present. It required ½ to 1 pint of acid to 800 gallons and according to the amount of usage the solution will require about ½ pint every 14 to 28 days—less when cold, more when warm. The solution will have a cleanly looking appearance, refractive and never forming but a trace of slug on the bottom, the anodes being uniformly attacked and dissolve very fastly under high current loads. Rack work gives best results under sharp, fast plate, while pickled grey iron should be started slow and then run on higher currents to avoid pitting, especially if very cold. Other than current regula-

tion I have seen no difference in the plating, even if ice had to be broken in the tank, except to lengthen the time of immersion.

Once used, always used, is my belief, for I would not want to be without it now after 7 or 8 years of use, both in jobbing trade and in manufactory on quantity and quality, chiefly store and counter scales, later instruments, I find it so much cheaper in upkeep, less bother, a clean solution, and most of all, a solution that does not peel except under abuse, as its adhering qualities are there.

I am really desirous to know how long the solution can be kept self-sustaining and be satisfactory, as now, after more than three years of constant use, it apparently is able to deliver the goods and to some very critical trade, and which oft times must be plated under adverse conditions for good plating, not having ample room or cleaning facilities that a modern shop should have.

The solution should not be loaded with iron in solution, as the more iron the harder the plate; also is not as reflective, but by using only high-grade anodes the nickel will have a very good lustre and white.

Never add the acid just before plating hollow ware or any article which requires a deep plate, such as pans or very deep reflectors, as the plating on the deep portion would be thin and unsatisfactory, but after the solution assimilates the acid there is no trouble, rather improves. Aluminum can be plated and guaranteed satisfactory, but zinc will cause the usual trouble, except by high current and moving; that is, where necessary to plate directly.

BLACK NICKEL SOLUTIONS

By W. E. Debolt (all rights reserved)

For the past two meetings we have had considerable discussion on producing a black nickel. Two (2) formulas have been given, as follows:

Double Nickel Salts	10 oz.	8 oz.
Potassium Sulpho-Cyanate	½ "	2 "
Zinc Sulphate	¼ "	1 "
Water	1 gal.	1 gal.

Old nickel anodes and a current of ½ volt pressure should be used in both cases. In the case of solution No.

1, it was stated that a dip in a weak hydrochloric acid made the deposit blacker.

You will notice that the same chemicals are used in both cases and both are claimed to give a good black deposit, although the proportions are very different. May I not ask some of you who can make the experiment to see if these solutions under identical conditions of temperature and current give identical deposits or what variation, if any, is necessary to produce the like results? I am sure that solution No. 2 will give the better results.

The reactive agents in the solution are double nickel salts and potassium sulpho cyanate. These react under certain conditions to give nickel sulphide. This is a black powder when dry and is what is deposited on the work. It would therefore seem that the zinc sulphate in the solution is superfluous. As a matter of fact, a black nickel deposit can be produced in a solution without zinc sulphate which is just as black and just as tough as in one which contains zinc sulphate. This can be done in the same length of time, but the current pressure will have to be increased to about 1½ volts.

The reason then that zinc sulphate is used in a black nickel solution is to increase the density of the solution, which means that the conductivity of the solution is increased and the power required to produce the finish is less. But we then have three (3) factors to contend with in the solution which makes regulation more difficult and then the operator must control the voltage more carefully; otherwise the zinc is liable to be deposited causing white spots on the work.

To sum up, a black nickel solution with zinc sulphate requires:

1. Less power to operate.
2. More care in regulating the current and
3. Is more difficult to maintain, due to its having three (3) salts instead of two (2).

Whereas, a solution without zinc sulphate requires:

1. More power.
2. Is easy to operate.
3. Is easy to maintain.

Power is cheap in the plating room. Therefore, it would seem that solution No. 2 would be the better to operate.

BLACK NICKEL PLATING

By H. H. Reama

Since there has been so much discussion on Black Nickel Plating, I have made a few experiments in that line and have found very good results in several different solutions.

However, I have selected four, which, in my opinion, are the best, and have samples from each solution.

Solution No. 1

8 ozs.	Double Sulphate of Nickel
1 "	Zinc Sulphate
2 "	Ammonium Sulpho Cyanide
16 "	Ammonia
	Water, 1 gallon

Solution No. 2

2 ozs.	Double Sulphate of Nickel
2 "	Ammonium Sulpho Cyanide
16 "	Ammonia
	Water, 1 gallon

Solution No. 3

8 ozs.	Double Nickel Sulphate
2 "	Arsenic
4 "	Sodium Cyanide
16 "	Ammonia
	Water, 1 gallon

Solution No. 4

8 ozs.	Double Nickel Sulphate
2 "	Arsenic
4 "	Sodium Cyanide
1 "	Zinc Sulphate
16 "	Ammonia
	Water, 1 gallon

Remarks

These solutions were worked with Nickel Anodes and ½ Volt Current and you can see by the samples that there is only a slight difference in the color of each sample. But in my opinion the solutions that contain zinc are really a better black than the solutions where the zinc is omitted.

No. 4 Solution, where the Arsenic and Sodium Cyanide replace the Sulpho Cyanide, seems to be, in my opinion, the best solution. However, this is merely a matter of opinion, as there is little difference in any of them. Theoretically

the Sulpho Cyanide Solution gives you a Nickel and Sulphur deposit which is really a Nickel Sulphide, whereas, the Arsenic Solution gives you a Nickel and Arsenic deposit, but nevertheless the little Arsenic there is in that solution does not seem to show on the color.

METAL FINISHERS EXPOSITION A SUCCESS

The Metal Finishers' Exposition conducted under the auspices of the Dayton Branch, A. E. S., is now a matter of history and from the standpoint of exhibitors, visitors and promoters it was a decided success. The exhibitor who had something to sell took orders and created a demand for his product. Those who had information, such as the Bureau of Standards, with Dr. Blum in charge, surely were there with the goods by exhibits and by private and public lectures.

The visitors surely went away with some new ideas about the problems involved in the plating and finishing of metals. Visiting platers and manufacturers learned more about the improvements that the supply houses have to offer by way of equipment and material.

The promoters were highly gratified in that the expenses of the undertaking were all met, with a balance for the 1924 exposition, which at present is planned to be 100 per cent. larger, and 70 per cent. of the floor space now spoken for.

Dayton Branch is to be congratulated, especially the committee—Kopf, Traine, Harter, Poce and Lamoureux.

BRANCH NEWS

New York Branch

The regular meetings of New York branch were held on March 9 and 23, at Broadway Central Hotel.

Mr. Mackie of Boston favored us with a visit and gave the members an interesting talk on co-operation of the members and interchange of ideas.

Papers were read on imitation antique silver on zinc and antique finish on silver; papers were forwarded to the editor for publication in REVIEW.

Mr. Stewart gave an interesting talk on the plating of copper on asphaltum shingles, fully describing the methods used by a large concern.

Samples of nickel on aluminum were shown the members of articles plated by an out-of-town member. The samples were bent and straightened and nickel showed no sign of lifting. The formula used was as follows: Articles were passed through a cleaner until gas starts to raise; rinsed and passed through a solution of water, 1 gal.; muriatic acid, ¼ oz.; chloride of iron, 4 ozs.; plated in a soft nickel solution, 8° Baume, 70° F., 2½ to 3 volts, with rolled anodes.

Blue on brass samples were shown; solution used, water, 1 gal., nitrate of iron, 3 ozs.; soll. hypo., 8 ozs.; tempt., 160 to 180° F. It was suggested to pass articles through a one-per-cent. muriatic solution to set color to prevent fading out.

French gray and black on brass—Articles were nickel plated, the high lights cut through, exposing the brass sufficient to taste for black, passed through an ammonia black solution. Samples shown were of a pleasing effect.

Cleveland Branch

Our open meeting on the 31st did not reach the proportions we anticipated, but we had a very interesting paper on bright nickel plating from Mr. Ter Doest. By **bright nickeling** is meant work that is not color buffed after plating. His procedure in preparing and scrubbing the work before plating was the most important feature to be considered. Plating done in single salt solution. Mr. TerDoest is conducting extensive operations and tests along this line, and also on acidity of solutions, and he has promised to have a paper on these matters later that will be highly appreciated by the society. We will try and remind Henry at frequent intervals of his promise.

Connecticut Valley Branch

Connecticut Valley Branch met on March 26 with a large proportion of members present and several visitors. Three applications for membership were tabled until the next meeting to permit publication of the applicants' name in the MONTHLY REVIEW.

It was decided to have a question box made and installed at the next meeting.

The Banquet Committee reported that conditions were unfavorable for a Connecticut banquet at this time, and that the affair had been postponed until next fall. The committee was discharged with a vote of thanks.

It was voted that Connecticut Valley Branch prepare a paper on "Cleaning," to be read at the July Convention, and Mr. Daybill was appointed to prepare it, with the help of whatever members he might call upon, for assistance.

A committee, consisting of Messrs. MacFadyen, Bagshaw, Miller, Stephenson and Paul, was appointed to arrange a box social and ladies' night for the next meeting.

The remainder of the evening was given over to a discussion of bright nickel solutions. Mr. Brockway of the Detroit Branch had kindly furnished us with the method he is using, and a number of the members will try it out and report results at the next meeting. Mr. Frank Clark testified to the good resuls that Mr. Brockway is getting on rapid, bright, nickel plating.

Detroit Branch

It was decided, after considerable discussion, to have a smoker instead of a banquet, and it will be held in June.

Under good of order, B. F. Miller reports in bright nickel plating that addition of litharge gave trouble and The Shepard Art Metal Company is using lead scetate for a substitute with excellent results. The litharge trouble seemed worse with low voltage up to 2; above 2 not so much;

with die-castings also uses citric acid. This firm is fixing up to go into this branch of nickel plating on an extensive scale, as it has cut their buffing costs 50 per cent., but will make exhaustive tests regarding amperes used in bright and ordinary solutions as a means of determining amount of metal deposited in each solution in a given time, as well as chemical cotrol and automatic control of switches on rheostadt. When satisfied as to accuracy will then give the data to the A. E. S. through Detroit Branch.

Mr. R. L. Shepard submitted a complete filtration system that is in practical use in their plant, with blueprints, costs, etc., which will be sent to the editor of MONTHLY REVIEW for publication.

Our old friend, E. S. Thompson, circulated among the members, and expects to make his future home in Detroit.

Mr. Strutz gave us a talk on the use of washing machines, previous to cleaning for plating the enameling, that was a gem.

Question—Will shorter anodes overcome burning of work on bottom? It was the consensus of opinion that under certain conditions it would, but with a solution, or work, agitated, it would be unnecessary to use shorter anodes.

Meeting was splendidly attended and broke up at a late hour.

St. Louis Branch

Regular meeting of St. Louis Branch was held on April 3, with a good attendance, F. Horath presiding.

One application for membership was received, and then other routine business was disposed of.

E. J. Musick gave a good "convention booster" talk, urging all who possibly can, to make plans to go to Providence. It is some trip, yet we expect St. Louis will be well represented. A letter from Wichita, Kansas, tells us that E. W. Heil will be there.

The subject for the evening's discussion was "Cleaning and Pickling." Four of the five members assigned for papers had alibis—all good ones—and the fifth one failed to appear or send word. However, the subject will start a good evening at a St. Louis meeting, any or all times. Frank Rushton wrote that he was more interested in cleaning chickens on his farm at Hollywood, Cal., and also hoped to clean up some money in his new line, the real estate business.

Newark Branch

On Friday, April 6, at 8:15 P. M., President O. J. Sizelove sounded the gavel and opened Newark Branch's regular meeting, with 15 members present and three visitors from New York Branch.

Mr. Fred Gumm, who has been employed in St. Louis, Mo., was present, speaking upon methods employed in the Middle West plating departments, and announcing that he is now employed in Newark and will be a regular attendant at our meetings.

Banquet Committee reported that all was in readiness for the banquet, April 21.

Chicago Branch

Chicago Branch held regular monthly meeting April 14, and in absence of President Bott and Vice-President Emmett, Past President J. P. Manz presided, and with all inclement weather, we had a fine meeting—quite a few out-of-town members and visitors from St. Louis Branch and one from Philadelphia Branch—and President Manz called on each for a few remarks, and all the members appreciated seeing Past President Manz in chair once again—he looked so natural.

Mr. R. J. Hazucha read enclosed paper on "Successful Cleaning." He had read it once before at Milwaukee Branch, but as it was never published, I requested him to turn it over to me to send to REVIEW. You may have a copy of it in your files now; if so, kindly return this copy to me, and oblige.

We are all boosting hard for the annual meeting at present and hope to send a large delegation to same from here.

Next meeting will be election of officers, and I hope to retire as secretary of Chicago Branch; too much work with both, and boys here have a large choice and can easily get me a successor. Lots of good, efficient help in this branch.

Question Box

Question No. 1—What is proper cyanide content of a hot copper solution for plating die castings, before nickel plating the same, if solution has 1 oz. metal content?

Answer No. 1—It was thought that it was not necessary to hot copper, the material in question, and if it was done, any hot copper solution would strike by simple immersion, and was suggested that the member have very low cyanide content, no amount specifically given.

Question No. 2—Why does a hot nickel solution (temp. 150 Fhr.) plate gray or brown, not white color that cold nickel does?

Answer No. 2—It was suggested that the member had solution too hot and was getting too rapid a deposit, which caused it to be porous and smutty.

Question No. 3—What is a good nickel strip for steel?

Answer No. 3—It was suggested to use sulphuric acid and small amount glycerine and lead cathodes and reverse current.

Question No. 4—What are benefits to be derived from adding caustic soda to a cyanide copper solution, and outside of hyposulphite of soda, what is a good brightener for cyanide copper solution?

Answer No. 4—Caustic soda, it was thought, gave a more rapid deposit in hot copper, but could not determine by discussion just why use it in a cold solution unless plating oily work to assist in cleaning, it was thought that hyposulphite of soda was most general used brightener for cyanide copper.

Question No. 5—Adding chloride of lime to a nickel solution, would the lime precipitate, leaving chlorine to form chloride of nickel? Could lime have any detrimental aspect on the solution?

Answer No. 5—It was thought that small additions of materials containing chloride of lime in small quantities did not injure the solution other than to absorb the boric acid.

Question No. 6—Adding barum chloride to nickel solution if chloride of nickel is formed, what becomes of the barium, if calcium of chloride is used instead? Will the results be the same?

Answer No. 6—It was thought that if nickel was heated before adding the barium chloride that the barium would be precipitated in more crystaline form and easier to recognize in precipitation. On calcium chloride it was thought that if it was pure enough results would be about the same.

Question No. 7—Would it be safe to put an iron tank to use for electro cleaning directly on the floor with no insulation? The floor is wood and damp, and what is lowest voltage that should be used?

Answer No. 9—It was thought for safety of tank it ought to be raised off floor slightly to prevent rusting of bottom and ventilation, but it could be used as per question, but not efficiently. As to voltage, amount of work and amount of current available would have to be known; also size of work to determine exact lowest voltage. Most users of electric cleaners either use no rehostant or a very large one.

Cincinnati Branch

Cincinnati Branch is holding meeting every 1st and 2nd Friday of each month at the Y. M. C. A. building, and have decided (at the last meeting) to attend the Metal Finishers' Exposition at Dayton, O., about twenty of them, and thought their time was well spent all around, and we are trying hard to establish a fully equipped laboratory in one of the high schools here, and have good promises, and will succeed at this very soon. May we then get to big things in the right way.

Grand Rapids Branch

On Saturday, March 24, the Grand Rapids Branch held its annual banquet at the Elks' Temple. It was a success. Successful, we repeat, for the Dear Ladies were present, and from soup to nuts there was gaiety and joviality.

After the splendid fried young broilers were done justice to, President Jacob Van Dyke of the Grand Rapids Branch made the address of welcome, and it will not be amiss to state here that since Mr. Van Dyke assumed the presidency of this branch the meetings have been largely attended. Mr. Van Dyke then introduced the toastmaster of the evening, Mr. Walter J. Allen, Supreme President of the A. E. S., who gave a few appropriate remarks. He then introduced Mr. Frank J. Hanlon of Chicago, Ill., the Supreme Secretary and Treasurer of the A. E. S., who gave a very interesting talk on the A. E. S. The Grand Rapids Branch hopes to have the honor again to hear Mr. Hanlon. Mr. Allen then called on Professor George Frazee of the Manual Training School of Grand Rapids, who gave a talk on "Pep." Professor Frazee is the personification of pep; it was pep that convinced the School Board of Grand Rapids that they should build a laboratory for the Grand Rapids Branch of the A. E. S. in the new vocational school, now under construction. After hearing a talk on pep by Professor Frazee, one just felt like getting up and shout-

ing for the joy of living, and we now give notice to Mr. Frazee he can depend to be called upon for a talk at any of this branch's entertainments. During the evening, at interval periods, the Rotary Quartette gave very harmonious music. Mr. Durant, an elocutionist of London, England, gave a splendid recital. We again hope to have the pleasure of listening to Mr. Durant. And in closing credit should be given to Mr. Charles Whalley, chairman of the Banquet Committee, for his untiring efforts in planning and producing the most successful banquet this branch has ever held.

Bridgeport Branch

The open meeting of March 16 was one long to be remembered by all those present. Our speakers' committee, Messrs. Karl and Oberender, secured Mr. George Hogaboom to talk to us on the "Technical Side of Electro-Plating." George has made a lot of speeches and given many interesting talks at various times and places, but this one surpassed them all. It was a very timely talk, considering that there has been so much written and discussed on this subject, and Bridgeport Branch feels that other branches would do well to have him give his talk at their meetings. Our last open meeting will be held on Friday, April 20, and intend to make this another old-timer's night with eats, etc., and we have again asked Mr. Hogaboom if he will deliver his talk again, as some of the members could not be present and missed something good.

Regular meeting report: Bridgeport Branch met on the 6th of April at their laboratory, 360 John street, with President Slattery in the chair and 32 members present. Minutes of previous meeting read and approved. The chairman of the Convention Committee then read a report on the progress of the convention, which as reported, is very encouraging. We had with us as a visitor Mr. McPhaden of the Hartford Branch, who, when called on, talked on various points of interest to the plater, particularly on zinc plating. One resignation was read and accepted with deep regret at our meeting, that of Mr. Clarence Wessel.

DEATHS

WYCKOFF—At East Orange, N. J., April 5, 1923, Henry Sexton, husband of Blanche Van O'Linda Wyckoff, in his 49th year. Services at his home, 2 Birchwood evenue (Hyde Park), Saturday evening, April 7, at 8 o'clock. Interment at Somerville, N. J.

WRIGHT—With profound sorrow we announce the death of Edwin Laughlin Wright of Collins & Wright, Pittsburgh, Pa., on the 21st day of March, 1923.

ELECTED TO MEMBERSHIP

Montreal Branch

Fred Benzier, Active .....928 Charlevioux, Montreal, Canada

Detroit Branch

Sidney A. Mount, Active .....234 Midland Ave., Highland Parks, Mich.
Joseph Scharmak, Active .....7431 Keen Ave., Detroit, Mich.
Frank E. Furge, Active .....5158 Pennsylvania Ave., Detroit, Mich.
Harry Moses, Active .....365 Lewiston Ave., Ferndale, Mich.
James A. Garvie, Active .....5906 Colfax Ave., Detroit, Mich.

Cleveland Branch

Earl Pettyjohn, Associate .....1384 Grant St., Akron, O.

Rochester Branch

Edward F. Moulder, Active .....40 Willow St., Johnson City, N. Y.
Dury E. Harper, Active .....32 Primrose St., Rochester, N. Y.

New York Branch

Ralph J. Liquori .....127 Vanderbilt Ave., Brooklyn, N. Y.
E. Lee Tannert .....2356 Waterbury Ave., Bronx, New York, N. Y.
Fred H. Stoffel .....583 Onderdonk Ave., Brooklyn, N. Y.

APPLICATIONS

Newark Branch

George H. Sharkey, Active.....18 Baldwin St., Newark, N. J.
Edwin B. Anderson, Active,
c|o Eastern Tool and Mfg. Co., 129 Bloomfield Ave., Bloomfield, N. J.
Robert Pecororo, Active .....153 Green St., Newark, N. J.

Detroit Branch

Charles Mascola, Active
Bernard T. Lewis, Associate

Grand Rapids Branch

Joseph Deucher, Active

Hartford Branch

Charles Joseph Griswold, Active.....Box 525 Westfield, Mass.

REINSTATEMENTS

Detroit Branch

A. F. Norgreu .....132 Castle St., Syracuse, N. Y.

REJECTIONS

Cleveland Branch

Silas Plummer .....Cleveland, O.

SUSPENSIONS

Chicago Branch

Erwin Sohn .....26 N. Jefferson St., Chicago, Ill.

Boston Branch

Ralph C. Barnstead .....45 Burt St., Dorchester Sta., Boston, Mass.

Hartford Branch

Thos. J. Murray .....8 Pleasant St., East Longmeadow, Mass.

BOSTON

Regular meetings are held third Friday of each month, at 8 p. m., at the American House, Boston. Secretary, A. W. Garrett, 821 Dorchester Ave., Dorchester, Mass.

BRIDGEPORT

Meets third Friday of each month in its laboratory, 260 John St., Bridgeport, Conn. Secretary, David Fleming, 97 Roosevelt St., Bridgeport, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p. m., at the Hardware Club of Chicago, Room 1125. Secretary, F. J. Hanlon, 216 N. Jefferson St., Chicago, Ill.

CINCINNATI

Meets on the first and third Friday in each month, Y. M. C. A. Building. Secretary, W. J. Husing, 729 McMakin Ave., Cincinnati, Ohio.

CLEVELAND

Meets last Saturday of each month at Hotel Winton. Secretary, B. F. McCormick, 2024 Wyandotte Ave., Lakewood, O.

HARTFORD

Meets on the fourth Monday of each month at 747 Main St., Hartford, Conn. Secretary, Tennant Elwin, Newington, Conn.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, C. Van Derau, 61 Bish Ave., Dayton, Ohio.

DETROIT

Meets first Friday of each month at the Old Colony Club, 2nd floor, Hotel Tuller. Secretary, E. W. Woodmensee, 1427 Lee Place. Detroit, Mich.

GRAND RAPIDS

Meets on the second Wednesday of each month at the Vocational High School, 129 Bostwick Ave., N.E. Secretary, Chas. S. Whalley, 931 Pine Ave., N.W., Grand Rapids, Mich.

INDIANAPOLIS

Meets the second Saturday of each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

MILWAUKEE

Meets second and fourth Thursdays of each month at Lipps Hall, 321 3d St. Secretary, R. Steuernagel, 1508 Concordia Ave., Milwaukee, Wis.

MONTREAL

Secretary, A. Geroux, 48 Craig West, Montreal, Quebec, Canada.

NEWARK

Meets first and third Fridays of each month at No. 17 Central Ave., Newark, N. J. at 8 p. m. Secretary, Royal F. Clark, 71 Chadwick Ave., Newark, N. J.

NEW YORK

Meets second and fourth Fridays of each month at the Broadway Central Hotel Parlors, New York City. Secretary, John E. Sterling, 468 Grand Ave., Long Island City, N. Y.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

PITTSBURGH

Meets first Saturday of each month at 8 p. m., at United States Bureau of Mines Bldg., Forbes St. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third Thursday of each month at 26 Custom House St., Room 16. Secretary, C. J. Poyton, 269 Ohio Ave., Providence, R. I.

READING

Meets on the second Tuesday of each month. Secretary, William M. Fisher, 654 Gordon St., Reading Pa.

ROCHESTER

Meets every second and fourth Saturday of each month at the Hotel Seneca. Albert H. Doering, Secretary, 49 Cutler St., Rochester, N. Y.

SYRACUSE

Secretary, M. J. Crean, 109 Court St., Syracuse, N. Y.

ST. LOUIS

Meets first Tuesday of each month at Barr Branch Library, corner Jefferson and Lafayette Sts. Secretary, H. H. Williams, 4156 Botanical Ave., St. Louis, Mo.

TOLEDA

Meets first Thursday of each month at Toledo University Science Building. Electro-Platers' Room, corner Cherry and Page Sts. Secretary, Wm. Grob, Erving St., Toledo, Ohio.

TORONTO

Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. Secretary, E. S. Turner, 873 St. Clair Ave., Toronto, Ontario, Canada.

WATERBURY

Meets every second and fourth Friday of each month. Secretary, Wm. Delage, 47 Prospect St., Waterbury, Conn.